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| 10/589,516 | 08/16/2006 | Robbyn Prange | 63563A US | 8221 |
| 109 7590 04/10/2009 The Dow Chemical Company Intellectual Property Section P.O. Box 1967 Midland, MI 48641-1967 | | | | |
| EXAMINER NEGRELLI, KARA B | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/589,516

Applicant(s)

PRANGE ET AL.

Examiner

KARA NEGRELLI

Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF 298)
Paper No(s)/Mail Date ____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

**CO-CATALYSIS OF AUTOCATALYTIC POLYOLS FOR LOW DENSITY
POLYURETHANE FOAMS WITH IMPROVED AGING CHARACTERISTICS**

Response to Amendment

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Any rejections stated in the previous Office Action and not repeated below are withdrawn.
3. The new grounds of rejection set forth below are necessitated by applicant's amendment filed on February 23, 2009. In particular, claims 1 and 13 have been amended to give a positive recitation the amine gelling catalyst is acid blocked.
4. It is noted that the newly introduced limitations were not present at the time of the preceding action. For this reason it is proper to make the present action FINAL.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 5-6, and 7-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ghobary et al. (US 2004/0029986) and further in view of Wendel et al. (US 2003/0032553).
7. Ghobary et al. teach a process for producing polyurethane foams comprising at least one organic polyisocyanate which can be an 80/20 or 65/35 mixture of 2,4 toluene diisocyanate and 2,6 toluene diisocyanate, respectively (which is a liquid at room temperature) (paragraph [0079]), a polyol with a functionality of 2 to 4 and a hydroxyl number of 15 to 700 (and preferably 20 to 60) (paragraphs [0066] - [0067]), a tertiary amine catalyst with a carboxylic acid moiety (paragraphs [0039], and [0048]-[0050]), water as a blowing agent (paragraph [0081]), and optional additives such as crosslinkers (paragraph [0045]). The quantity of hydroxyl carboxylic acids reacted with amines can be adjusted to reach a desired reactivity. The catalyst systems disclosed by Ghobary et al. will generally be between 2% and 80% amine acid reaction product, based on the total amine equivalents in the formulation (pertaining to instant claims 1 and 11, paragraph [0065]).
8. Ghobary et al. also teach that suitable hydroxyl functional acids for use in the catalyst system include salicylic, gluconic, or glycolic acid (pertaining to instant claims 7-10, paragraph [0050]).
9. Ghobary et al. fail to teach that the catalyst is a cyclic amine acid-blocked gelling catalyst. However, Wendel et al. teach an acid blocked amine catalyst for use in the preparation of polyurethanes, including flexible polyurethane foams, and said amine of which can be triethylenediamine (paragraphs [0001], [0012], and [0018]). The catalyst

taught by Wendel et al. can be used to catalyze the reaction between an isocyanate and a compound containing a reactive hydrogen such as a polyol (the gelling reaction) (paragraph [0021]).

10. It would have been obvious for one of ordinary skill in the art to use the acid blocked amine catalyst taught by Wendel et al. in the invention taught by Ghobary et al. because use of the acid blocked amine catalyst disclosed by Wendel et al. results in a polyurethane with improved flowability and little or no corrosion (paragraph [0015]).

11. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ghobary et al. (US 2004/0029986) and further in view of Wendel et al. (US 2003/0032553) and Casati et al. (WO 03/029320).

12. Ghobary et al. and Wendel et al. teach the compositions as applied to claim 1 but fail to teach the polyol is an alkylene oxide adduct of an initiator having N-alkyl, N,N dialkyl amino groups, or a mixture thereof, wherein the alkyl group is C1 to C3, that the polyol is an alkylene oxide adduct of an initiator having N-methyl, N,N dimethyl amino groups, or a mixture thereof, or that the polyol is a hydroxyl terminated polyol capped with N,N-dialkyl-glycidylamine.

13. However, Casati et al. teach a process for a polyurethane product by reaction of a mixture of (a) at least one organic polyisocyanate (page 5, line 32), and (b) polyol composition comprising (b1) from 0 to 99 percent by weight of a polyol compound having a functionality of 2 to 8 and a hydroxyl number from 20 to 800 and (b2) from 100 to 1 percent of at least one autocatalytic polyol with gelling characteristics, having a functionality of 1 to 8 and a hydroxyl number of from 15 to 800, wherein the weight

percent is based on the total amount of polyol component (b) (page 5, line 33 - page 6, line 5), in which one or more catalysts can be used for the reaction, including tertiary amine compounds (page 21, lines 22-25), for example triethylene diamine, dimethylbenzylamine, or N,N-dimethylcyclohexylamine (page 21, lines 29-26), the process for which water is the preferred blowing agent for a flexible foam (page 19, line 22), and optionally additives or auxiliary agents know per se for the production of polyurethane foams can be included (page 9, lines 6-8).

14. Casati et al. also teach that the polyol (b2) can be made by the addition of alkylene oxide to an initiator molecule, said initiator molecule of which can have any of the formulas disclosed on page 6, line 5 to page page 9, line 3, said formulas of which include the compounds listed in claims 2-4 of the instant application (WO 03/029320).

15. It would have been obvious for one of ordinary skill in the art to include the alkylene oxide of Casati et al. in the polyol of Ghobary et al. because the autocatalytic polyols with gelling characteristics taught by Casati et al. improve polyurethane aging via elimination of organometallic salt catalysts or reduction in the amount of amine catalysts (including triethylene diamine) (Casati et al., page 4, lines 27-29). The acid blocked amine catalysts of Ghobary et al. and Wendel et al. would lend to balance of gelling and blowing reactions when producing polyurethanes (Wendel, paragraph [0005]), while the polyols of Casati et al. further lend to gelling properties, resulting in a polyurethane product with improved aging (from the polyols of Casati et al., page 4, lines 27-29), improved flowability and little or no corrosion (Wendel et al., paragraph

[0015]), and improved HACS, hardness, a more open or more easily opened cell structure, and reduced foam shrinkage (Ghobary et al., paragraph [0061]).

Response to Arguments

16. Applicant's arguments filed February 26, 2009 have been fully considered but they are not persuasive.

17. Applicant's arguments with respect to claims 1-13 have been considered but are moot in view of the new ground(s) of rejection.

18. Applicant argues that the delayed action catalysts of Ghobary et al. are to delay the foaming reaction and that the catalysts of Ghobary et al. are non-cyclic.

19. Tertiary amine catalyst accelerate **both** gelling (reaction of polyol with isocyanate) and blowing (reaction of water with isocyanate to generate carbon dioxide) reactions and have further been shown to be effective in balancing the blowing and gelling reactions to produce a desirable product (Wendel et al., paragraph [0005]). Combining the inventions disclosed by Ghobary et al. and Wendel et al. would result in a cyclic acid-blocked amine catalyst capable of balancing the blowing and gelling reactions, and would further result in a polyurethane with improved flowability and little or no corrosion (Wendel et al., paragraph [0015]).

20. Applicant further argues that when an acid-blocked tertiary amine catalyst is used in formulation with an amine initiated polyol, a foam is produced with very poor humid aging compression set (HACS). However, in paragraph [0086] of the present invention, the application teaches that a good blend is obtained when an amine initiated polyol is

combined with other polyols, a crosslinker, a surfactant, and an acid-blocked amine catalyst. Thus, combining the references of Ghobary et al., Wendel et al., and Casati et al. would not produce a foam with very poor HACS, but on the contrary, would produce a foam with good HACS properties.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARA NEGRELLI whose telephone number is (571)270-7338. The examiner can normally be reached on Monday through Friday 8:00 am EST to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571)272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KARA NEGRELLI/
Examiner, Art Unit 1796

/Robert Sellers/
Primary Examiner
Division 1796